



DEPARTMENT OF THE NAVY

ATLANTIC DIVISION  
NAVAL FACILITIES ENGINEERING COMMAND  
NORFOLK, VIRGINIA 23511-6287

0277  
TELEPHONE NO.

(804) 445-1814

IN REPLY REFER TO:

5090

1143CFIB

22 JUL 1986

U.S. Environmental Protection Agency  
Attn: Mr. Jim Holdaway  
Region IV  
345 Courtland Street  
Atlanta, GA 30365-2401

Re: NACIP Confirmation Study, Marine Corps Base, Camp Lejeune

Gentlemen:

As discussed in a telephone conversation between Jim Holdaway and Cherryl Barnett of July 19, 1986, we are enclosing the scope of work for additional NACIP efforts at Camp Lejeune. We hope you will have a chance to review this prior to our meeting of July 31, 1986, and that it may answer some of your comments on our previous submittal, the Round One Sampling report. We anticipate the NACIP contractor, Environmental Science and Engineering, Incorporated, beginning these efforts in the August/September timeframe.

Sincerely,

J. R. BAILEY, P.E.

Head, Environmental Quality Branch  
Utilities, Energy and Environmental  
Division

By direction of the Commander

Encl:

(1) Scope of Work for Round Two Sampling and Characterization/Feasibility

Copy to:

MARCORB Camp Lejeune

Division of Environmental Management

Attn: Mr. R. Paul Williams

Director

P.O. Box 27687

Raleigh, NC 27611-7687

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Enclosure (1)

CONTRACT N62470-83-C-6106  
SCOPE OF WORK FOR ROUND TWO SAMPLING  
AND CHARACTERIZATION/FEASIBILITY

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## 1. Verification Step Efforts

- a. Site 1, French Creek Liquids Disposal Area: Sample and test surface water and sediments in two locations on Cogdels Creek; sample and test the six shallow wells. Add o,m,p-xylene, MEK, MIBK, EDB, and hexavalent Cr to the analytical parameters for round one.
- b. Site 2, Former Nursery/Day Care Center: Sample and test Well 2GW1. Sample soil at four locations (0-1' composite) in the vicinity of sample 2S4; sample surface water and sediment from the drainage ditch in two locations; install four shallow two-inch wells in locations directed by the EIC. Sample new wells twice at an interval of 60 days. Analyze each sample for OCP, OCH, dioxin, and VOA.
- c. Site 6, Storage lots 201 and 203: Install eight shallow two-inch wells in locations directed by the EIC. Sample wells twice at a 60-day interval. Sample surface water and sediment both upgradient and downgradient at Bearhead and Wallace Creeks adjacent to the site. Analyze all samples for DDT-R and VOA.
- d. Site 9, Fire Fighting Training Pit: Resample and test the two shallow wells. Install a third well in a location directed by the EIC and sample twice at a 60-day interval. Analyze all samples for o,m,p-xylene, MEK, MIBK, EDB and hexavalent Cr in addition to round one parameters.
- e. Site 21, Transformer Storage Lot 140: Sample soil at eight locations around perimeter of site, including two samples from drainage ditch. Sample four depths at each location (0-1', 1-3', 3-5', and at 5') and analyze for OCP, OCH, PCB, dioxin. Resample well GW21-1 and analyze for VOA, OCP, OCH, PCB, dioxin, xylene, MEK, MIBK, EDB, and oil and grease.
- f. Site 24, Industrial Area Fly Ash Dump: Install two downgradient wells in locations directed by the EIC. Sample new wells twice at a 60-day interval. Sample five shallow wells, existing surface water locations and two new surface water/sediment locations on tributaries to Cogdels Creek and analyze all samples for metals A, VOA, and hexavalent Cr.
- g. Site 28, Hadnot Point Burn Dump: Install new upgradient well and sample twice at a 60 day interval. Sample three existing shallow wells, New River surface water and sediments in four locations, resample surface water sediment at two previously identified locations, and one new surface water/sediment location in Cogdels Creek near new upgradient well. Analyze all samples for round one parameters, dioxin, o,m,p-xylene, MIBK, MEK, and hexavalent Cr.
- h. Site 30, Combat Town Training Area: Install another well downgradient and sample twice at a 60-day interval. Sample shallow well, surface water/sediment in French Creek and analyze all samples for same parameters as listed for round one plus xylene, MEK, MIBK, and EDB.

i. Site 35, Camp Geiger Area Fuel Farm: Install three shallow two-inch wells in locations directed by the EIC. Sample twice at a 60-day interval. Sample surface water and sediments from Brinson Creek in two locations; analyze all samples for Pb, VOA, EDB, xylene, and O&G.

j. Site 36, Camp Geiger Area Dump: Install new upgradient well; sample twice at a 60-day interval. Resample four shallow wells; sample surface water and sediments from Brinson Creek and unnamed creek south of site in two locations. Analyze all samples for parameters listed in round one, o,m,p-xylene, MEK, MIBK, EDB, and hexavalent Cr.

k. Site 41, Camp Geiger Dump: Resample four shallow wells. Add new upgradient well and sample twice at a 60-day interval. Sample surface water and sediment from Tank Creek in two locations and unnamed creek in two locations and analyze all samples for parameters listed in round one plus dioxin, o,m,p-xylene, MEK, MIBK, and hexavalent Cr.

l. Site 45, Campbell Street Underground Fuel Storage Area: Install new well south of fuel farm; sample twice at 60-day interval. Resample three shallow wells and surface water/sediment from the drainage ditch in two locations. Analyze water samples for Pb, O&G, VOA, EDB, and xylene. Sample soil in six locations along perimeter of fuel farm and avgas storage. Composite 5' borings into 3 samples, 0-1', 1-3', and 3-5', analyze soil and sediment samples for Pb, O&G.

m. Site 54, Crash Crew Fire Training Burn Pit: Install one upgradient and one downgradient well at site and sample twice at a 60-day interval. Resample Well 54GW1, drainage ditch surface water and sediments in three locations and analyze for round one parameters, o,m,p-xylene, MEK, MIBK, EDB, and hexavalent Cr.

n. Site 68, Rifle Range Dump: Resample three shallow wells and analyze for round one constituents plus o,m,p-xylene, MEK, MIBK, and EDB.

o. Site 69, Rifle Range Chemical Dump: Resample eight shallow wells and three surface water locations. Sample surface water and sediments from two unnamed guts southeast of site. Analyze all samples for parameters listed in round one plus dioxin, o,m,p-xylene, MEK, MIBK, and EDB.

p. Site 73, Courthouse Bay Liquid Disposal Area: Replace failed Well 73:GWA at a location closer to Courthouse Bay to allow for construction activities in that area. Install new upgradient well and sample twice at a 60-day interval. Resample four shallow wells and sample Courthouse Bay surface water and sediments in three locations. Analyze all samples for parameters listed in round one, o,m,p-xylene, MEK, MIBK, EDB, and hexavalent Cr.

q. Site 74, Grease Pit and Pest Control Area: Install a third well west of site; sample twice at a 60-day interval. Resample two shallow wells and analyze all samples for OCP, OCH, PCBs, dioxin, and VOA.

r. Site 75, MCAS Basketball Court: Resample three shallow wells and analyze for VOA, chloropicrin, and dioxin.

s. Site 76, MCAS Curtis Road: Resample two shallow wells and analyze for VOA, chloropicrin, and dioxin.

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t. Site A, MCAS (H) Officers Housing Area: Install three shallow wells along the perimeter of the site described in Attachment A. Sample wells twice at a 60-day interval; analyze for VOA, O&G, and free chlorine. Sample surface water and sediment and analyze for free chlorine (SW only), O&G, and VOA.

u. For the 54 wells installed under round one: Install two additional protective bollards and fill with concrete. Pour 5' x 5' concrete pad around well and bollards; paint well bollards day-glo orange. Use monitoring well construction specifications, Attachment B, for installation of new wells.

v. Sample all potable wells on MCB Camp Lejeune and MCAS New River (approx. 100). Composite samples from a maximum of ten wells serving the same water treatment plant (except for "contaminated" wells listed below) and analyze for priority pollutants except VOA; and barium, nitrate, chloride, iron, manganese, sodium, sulfate, THMs, color, TDS and turbidity; and EDB. Analyze all 100 samples for VOA, xylene, MEK and MIBK. If any parameter(s) from the composite exceed(s) regulatory limits or suggested guidelines for potable water, analyze samples for only that (those) parameters from the individual wells in the composite to pinpoint the source of contamination. Scope and analysis to be adjusted as needed by the EIC pending composite sample results. These "contaminated" wells have been shut down by MCB Camp Lejeune: 601, 602, 608, 634, 637, 651, 652 and 653. Sample these wells individually and analyze for priority pollutants, xylene, MEK, and MIBK, barium, nitrate, chloride, iron, manganese, sodium, sulfate, THMs, color, TDS, and turbidity.

w. For the contaminated wells 651, 652, and 653, conduct an extensive physical survey and document review to identify potential sources of contamination. Perform a 150 point (two-week) soil gas investigation to delineate potential contamination source areas; install additional shallow wells (up to six per potable well for cost estimating purposes) to verify findings. Perform two rounds of sampling at these wells; analyze samples for volatile organics, xylene, MEK, and MIBK.

x. Close out contaminated wells at Sites 36, 41, and 68 in accordance with state regulations (15 NCAC 2C). Submit an abandonment report including round one data and evaluation for these wells, to MCB Camp Lejeune for forwarding to the appropriate state agency.

y. Within 80 days of initiation of the on-site verification investigations, evaluate all data generated with the two sampling events and discuss quantitatively whether contamination has the potential to or is presently affecting the environment or human health. Present the findings as part of the monthly progress reports. Furnish the EIC with two copies and the activity with three copies of the progress report with the study results. The report should include: a description of all sampling and chemical analytical methods used; a presentation and evaluation of the analytical data; an assessment of actual/potential contamination and migration; ground level elevations and water levels (0.01 ft. accuracy) in all wells; boring logs; a detailed surveyed site plan showing the location of suspected contaminant sources, wells, etc.; known toxicity information on contaminants found; current standards/limits for acceptable levels of contaminants found, including those issued/published by EPA, CDC, NIOSH, OSHA, State and local regulatory/health agencies and/or any other established regulatory/advisory agencies as approved by the EIC and recommendations for immediate site clean up or third round monitoring. Government comments and recommendations will be made via the EIC within 30 calendar days after receipt of the progress report.

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## 2. Characterization/Feasibility Step Efforts

a. In accordance with the original scope of work, conduct Step IB, Characterization, for the Hadnot Point industrial area (bounded by Smeads Ferry Road, Codgels Creek, the New River, and Wallace Creek) and for the deep potable water aquifer influenced by wells serving the Hadnot Point treatment plant. The pump houses for these wells are numbered:

601	613	633	642
602	614	634	650
603	615	635	651
606	616	636	652
608	620	637	653
609	621	638	654
610	626	639(2)	655
611	627	640	LCH-4006
612	632	641	LCH-4007

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The objectives of the characterization step are as follows:

(1) Locate source of VOCs detected in deep water supply wells 601, 602, 608, 634, 637, and 642.

(2) Determine concentration of detected parameters in source area(s).

(3) Determine aquifer characteristics: transmissivity, hydraulic conductivity, permeability, storage coefficients and degree of confinement for both deep and shallow aquifers.

(4) Determine rate and direction of groundwater and contaminant flow for the deep potable water supply aquifer influenced by wells listed above, and for the shallow aquifer in the Hadnot Point industrial area.

Conduct an extensive physical survey and document review for activities within the industrial area to identify potential sources of contamination. Perform a 150 point (two week) soil gas investigation to delineate the source areas; install additional wells to verify findings. Fourteen additional shallow wells will be required in this area, including seven which will form pairs with potable wells 601, 602, 603, 608, 634, 637, and 642. Perform an estimated three rounds of sampling at the seventeen Site 22 shallow wells at 60-day intervals; add xylene, MEK, MIBK, and EDB to the round one verification step parameters.

Perform 144 hour aquifer testing to determine aquifer characteristics and rate and direction of ground water and contaminant flow. Install three observation wells of 70', 90' and 200' for aquifer testing. Potable water wells shall be evaluated for various well pumping combinations. Access holes will be drilled, threaded and removable plugs installed in the tops of potable wells to provide a means of logging the depths of the water levels in the wells under study. The elevations of these plug holes above mean-sea-level shall be accurately determined by surveying. The method described in Attachment C or another commonly used method/model, as approved by the EIC, shall be used to determine the flow characteristics and contaminant profiles of the aquifers under study.

Within 30 days of completion of the Characterization Step on-site investigation, submit the Step IB preliminary report of the study results. The report should

include: a description of all sampling and chemical analytical methods used; a presentation and evaluation of the analytical and geotechnical data; an assessment of actual/potential migration; detailed surveyed site plan with surface elevations, well locations (horizontal and vertical from benchmarks as directed by the EIC) and water levels (0.01 ft. accuracy) in all wells; the location and levels of suspected contaminant plumes and/or contaminant sources; known toxicological information on contaminants found, and current standards/criteria for acceptable levels of contaminants found, including those issued/published by EPA, CDC, NIOSH, OSHA, State and local regulatory/health agencies, and/or any other established regulatory/advisory agencies as approved by the EIC. Requirements for preliminary and draft report, submissions for Step IB are outlined in Section 3.

b. Conduct Step II Feasibility for the Hadnot Point industrial area. Specify and evaluate five each interim and long-term feasible alternatives for cleanup of contaminated aquifers; include projected effectiveness and cost estimate for each alternative in your evaluation.

c. At the Government's option, conduct additional services at the prenegotiated prices as described below:

(1) Conduct additional laboratory sampling and analysis per the Marine Corps Base, Camp Lejeune Round Two Sampling and Analysis Summary Table attached.

(2) Conduct additional well drilling at a total cost of \$39.00 per foot.

(3) Conduct additional one week (75 points) soil gas investigation at a total cost of \$23,356 each.

Within 30 days of submission of the ~~characterization~~ step draft report, submit a preliminary report of the feasibility study. Preliminary and draft report submission requirements for Step II are outlined in Section 3.

### 3. Preliminary and Draft Confirmation Study Reports

In accordance with the completion dates established for each step, furnish the EIC with five copies and the activity with five copies of the preliminary report. Within 30 days, the Government will review and provide comments to the contractor via the EIC. Present EIC/Activity debriefing at the activity during the Government review period. Address the comments, and within 30 days provide five copies of the draft report to the EIC and five copies of the draft report to the activity for issuance to the regulatory agencies for their review.

Present the findings of the draft report for each study step to EPA Region IV and to the North Carolina Division of Environmental Management. These briefings shall be held at the Marine Corps Base, Camp Lejeune as arranged by the EIC and in consort with the activity representative.

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# MILESTONE CHART

<u>Milestone</u>	<u>Day</u>
Government Issuance of Change Order	0
Submit POA&M and Safety/Contingency Plan for Characterization Effort	10
Government Approval of POA&M and Safety/Contingency Plan	17
Initiate Characterization On-Site Investigations for Hadnot Point Industrial Area	45
Initiate Round Two Sampling, Verification Step	45
Initiate Potable Well Sampling	45
Submit Report with Round Two Results, Potable Well Results	125
Return of Government Comments	155
Complete Characterization On-Site Investigation	260
Submit Preliminary Report with Hadnot Point Characterization Step Results	290
Return of Government Comments	320
Submit Characterization Step Draft Report for Hadnot Point	350
Submit Preliminary Feasibility Step Report for Hadnot Point	380
Return of Government Comments	410
Submit Feasibility Step Draft Report for Hadnot Point	440

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SCOPE OF WORK FOR ADDITIONAL SOIL BORINGS,  
MCAS (H) NEW RIVER FUEL PIPELINE INVESTIGATION

1. Perform 23 soil borings to depths of 10' at the locations shown in Attachment A. (The attached sketch is from a 1983-Soil and Materials Engineering Study which was forwarded to you on 8 February 1984). A drill rig will be required for this effort, since previous attempts at hand augering have been unsuccessful. Note the presence or absence of fuel by visual inspection during the drilling. After a period of 24 hours, measure and record the depth to water or fuel in each borehole; sample the liquid and note the presence or absence of fuel and the thickness of the fuel lens.
2. Prepare a separate report on this investigation, to include boring logs and sketches, and submit three copies to this Command and three copies to MCCB Camp Lejeune.
3. This investigation should be completed within ninety days of contract award.

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30 JUL 1986

Assistant Chief of Staff, Facilities, Marine Corps Base, Camp  
Lejeune  
Director, Natural Resources and Environmental Affairs Division

MONITORING FOR DRINKING WATER SYSTEMS

Ref: (a) PHONECON btwn Mr. Jerry Perkins, Acting Director, N.C. Water  
Supply Branch and Mr. Alexander, FAC, dtd 7 Jul 86  
(b) 40 CFR 141 -

1. Per reference (a), approval was verbally granted to reduce  
VOC sampling of finished water at Hadnot Point and TT systems  
from weekly to quarterly and for TT-25 well from monthly to  
quarterly. This frequency appears to comply with pending EPA  
rules at reference (b) on this subject. Final regulations may  
increase the sampling to monthly for sources detected to contain  
VOC.

2. Our POC is Mr. Alexander, ext. 3034.

B. W. ELSTON  
By direction

Copy to:  
BMO  
EnvEngr

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# Location of Closed Drinking Water Wells at MCB CLWC.

24 July 86.

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Drinking Water  
Well Number

Location 0000001519

- |  |  |
|--|--|
| 601 (renumbered <sup>to be</sup> 660)      | Corner of Holcomb Blvd and Dogwood St.   |
| 602  | Corner of Holcomb Blvd and Ash St.   |
| 608  | In area behind Steam Plant at the end of Michael Road.                               |
| 634  | On Smead's Ferry Road across road from Bldgs. 903 and 904.                           |
| 637  | Corner of Holcomb Blvd and Parachute Tower Road (Outdoor Theater)                    |
| 651  | Corner of Old Pixie Green Rd and Old Beach Ave                                       |
| 652  | On Lyman Rd. (on left) about $\frac{1}{2}$ mile from Smead's Ferry Rd.               |
| 653 (was numbered <del>renumber</del> 619) | On Old Pixie Green Road (on right) 0.4 mile N of Wallace Creek.                      |
| TT-26                                      | Corner of Igejima Blvd and Tarawa Blvd.  |
| TT-NEW                                     | On Tarawa Blvd (on right) between TT No 61. <del>then School and Peleliu Drive</del> |

Month of Sept  
ASSISTANT CHIEF OF STAFF, FACILITIES  
HEADQUARTERS, MARINE CORPS BASE

8 will be tested,

DATE 8/5

TO:

BASE MAINT O

PUBLIC WORKS O

COMM-ELECT O

DIR., NAT. RESOURCES & ENV. AFFAIRS

UTIL.  
DIR, FAMILY HOUSING

DIR, BACHELOR HOUSING

BASE FIRE CHIEF

ATTN: N.A.C.I.P. study.

1. Attached is forwarded for info/action.

~~2. Please initial, or comment, and return all papers to this office.~~

Your file copy.

V/R  
A

"LET'S THINK OF A FEW REASONS  
WHY IT CAN BE DONE"

MCBCL 5216/21 (REV. 04-85)

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